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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/891,795	06/25/2001	Bin Zhao	12569-04/NEC	1464

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EXAMINER

CURTIS, CRAIG

ART UNIT PAPER NUMBER

2872

DATE MAILED: 05/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
09/891,795

Applicant(s)

ZHAO

Examiner

Craig Curtis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Feb 21, 2003
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 24-49 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 24-49 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____ 6) ☐ Other:

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DETAILED ACTION

Disposition of the Instant Application

- This Office action is responsive to Applicant's Amendment A filed on 21 February 2003, which has been made of record in the file as Paper No. 5.
- By this amendment, Applicant has canceled without prejudice claims 1-23 and newly added claims 24-49; thus, claims 24-49 currently are pending in the application.

Specification Objections

1. The disclosure is objected to because of the following informalities: The Applicant has failed to identify explicitly which particular elements of the instant invention are to be taken as being spatial birefringent elements. It is understood that by "spatial" birefringent, the Applicant is merely making explicit an inherent property exhibited by birefringent elements in those instances in which two orthogonally polarized light beams traverse such elements: namely, that the optical path length (defined as the product of the physical path length (l or d , say) light takes in traversing such elements & the index of refraction (n_o or n_e) associated with the polarization state of a particular light beam) will necessarily depend upon the polarization state (ordinary or extraordinary) of light traversing said "spatial" birefringent element. This, however, does not change the fact that at present the Applicant has not clearly identified which element or elements of the instant invention are to be taken as being spatial birefringent elements. Are beam displacing elements 10, 11, and 18 (all in Fig. 1) to be so considered, or are waveplates such as 21a, 22a, etc., to be accorded such distinction? Appropriate correction is required.

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Claim Objections

2. Claims 25-36 are objected to because of the following informalities: The indicated dependency of claim 25 is in error. The dependency of this claim should be changed from claim 25 (as presently recited) to claim 24; claims 26-36 inherit this deficiency.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 36 and 49 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. More specifically, proper antecedent support has not been provided in line 1 of either of these claims for the limitation "...*the* interleaved channels" (Emphasis added.)

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

4. The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this

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application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 24-31 & 37-44 are rejected under 35 U.S.C. 102(e) as being anticipated by Chang et al. (6,335,830).

With regard to claims 24 and 37, Chang et al. disclose (with, e.g., reference to Fig. 4a) the invention as claimed--An interleaver comprising:

a birefringent element assembly (all or any part of the system depicted in Fig. 4a) comprising at least one spatial birefringent element (e.g., 400, 492, 490), the birefringent element assembly providing two output components. See, e.g., 493, 495;

a reflector (450 and/or 452 and/or 472) configured to direct the two components from the birefringent element assembly back through the birefringent element assembly. See Fig. 4a; and

wherein each spatial birefringent element defines two light paths (See Fig. 4a), each light path having a different optical path length (inherent) and wherein a difference in optical path length between the two paths is provided by a material having an index of refraction greater than one (inherent; it is respectfully suggested, incidentally, that the recitation "one" be changed to "unity") which is disposed within at least a portion of one of the first and second paths (inherent). See Fig. 4a.

With regard to claims 25 and 38, Chang et al. further teaches wherein said interleaver comprises a polarization rotator (402) configured to make the two components approximately the same in polarization with respect to one another prior to the two components being transmitted back through the birefringent element assembly.

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With regard to claims 26 and 39, said reflector comprises a prism (450 and/or 452).

With regard to claims 27 and 40, said reflector comprises a mirror. See col.7, ll. 15-19.

With regard to claims 28 and 41, Chang et al. explicitly disclose wherein said polarization rotator comprises a half-wave waveplate. See col. 5, ll. 38-41.

With regard to claims 29 and 42, Chang et al. further disclose wherein said reflector comprises a mirror and a quarter-wave waveplate. See col.7, ll. 15-19.

With regard to claims 30 and 43, the birefringent element assembly of the interleaver of Chang et al. comprises a plurality of spatial birefringent elements (e.g., 400, 490, 4902, 410, 430, etc.).

With regard to claims 31 and 44, Chang et al. is taken to meet the recited limitations wherein said birefringent element assembly comprises a first birefringent element having an equivalent angular orientation of ϕ_1 (402) a second birefringent element having an equivalent angular orientation of ϕ_2 (410), and a third birefringent element having an equivalent angular orientation of ϕ_3 (430) (it being noted that as presently recited, ϕ_1 , ϕ_2 , and ϕ_3 can be either identical to or distinct from one another); wherein an order of the first birefringent element, second birefringent element, and third birefringent element is (selected from the group consisting of):

first birefringent element, second birefringent element, and third birefringent element.

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Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 32-36 & 45-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang et al. (6,335,830).

With regard to claims 32 and 45, Chang et al. disclose the invention as set forth, including wherein said first birefringent element has an equivalent angular orientation of 45° (col. 5, ll. 38-41) and having a phase delay of Γ (inherent) EXCEPT FOR explicit teachings of the following:

wherein said second birefringent element has an equivalent angular orientation of -21° and having a phase delay of 2Γ ; and

said third birefringent element has an equivalent angular orientation of 7° and having a phase delay of 2Γ .

It is notoriously old and well-known in the optical filter art, however, to assemble optical systems (Solc filter systems, for example) in which first, second, and third birefringent elements respectively have the above-recited equivalent orientations. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the invention of Chang et al. such that said second and third birefringent elements be disposed having the above-recited equivalent orientations, for

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at least the purpose of allowing a passband of said interleaver to be flattened to a selectable degree, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

With regard to claims 33 and 46, said birefringent element assembly comprises two birefringent elements. See above.

With regard to claims 34 and 47, please see the comments made above with respect to claim 32 and 45

With regard to claims 35 and 48, please see Fig. 4a.

With regard to claims 36 and 49, it is submitted that said interleaved channels have spacing (read: spacings) which is (read: are) tunable.

Response to Arguments

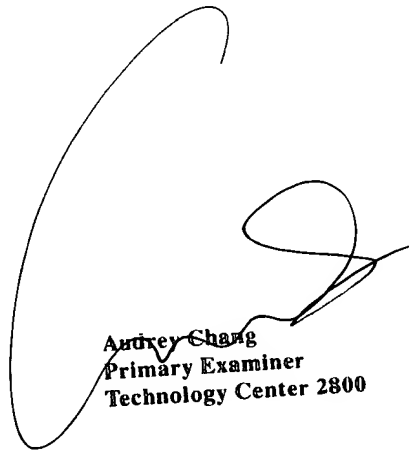
7. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

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Contact Information

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig Curtis, whose telephone number is (703) 305-0776. The facsimile phone number for Art Unit 2872 is (703) 308-7721.

Any inquiry of a general nature regarding the status of this application should be directed to the Group receptionist, whose telephone number is (703) 308-0956.



**Audrey Chang
Primary Examiner
Technology Center 2800**


Craig H. Curtis
Group Art Unit 2872
1 May 2003